

Name: _____

Algebra II: Midterm Review Questions

1. Simplify each expression completely.

SHOW ALL WORK ON A SEPARATE SHEET

a. $(4x - 2)(x + 3)$

b. $(3x - 1)^2$

c. $(2x^2 + y^2)^2$

2. Simplify each expression completely. No decimals or negative exponents

a. $(4x^2y^3z)(-2x^3y^4z^2)$

b. $\left(\frac{-6x^3y^2}{4xy^3}\right)^3$

c. $(2xy^{-3}z^3)(-5x^3y^2z^{-2})$

3. Factor each expression completely.

a. $9x^2 - 6x$

b. $16x^2 - 49$

c. $4x^3 - 16x^2 - 20x$

4. Solve each quadratic equation using the zero product property.

a. $x^2 - 8x + 16 = 0$

b. $3x^2 - 16x - 12 = 0$

c. $-x^2 + 12x = 0$

5. Solve each quadratic equation. Write solution in exact and rounded form.

a. $x^2 + 3 = 5x$

b. $40 = 10(x + 3)^2$

6. Solve each absolute value equation.

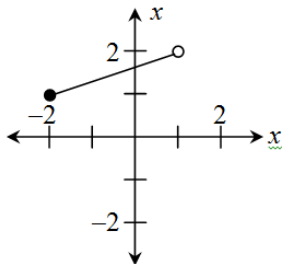
a. $|2x - 1| = 7$

b. $|3 + 2x| = -5$

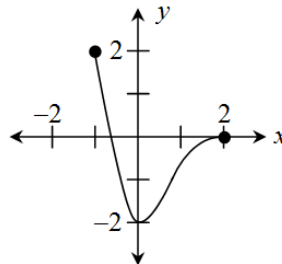
c. $10 - |6 - 3x| = -30$

7. Identify the domain and range of each graph shown.

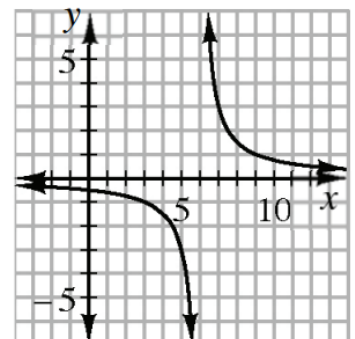
a.



b.



c.



8. Find the rule for the table below. Write the rule in standard form.

x	-1	0	1	2	3	4
y	8	3	0	-2	0	3

9. Draw a complete graph (use graph paper!) of the solution region for the system below:

$$y < x^2 - 3x - 4$$

$$y \geq -\frac{1}{2}x + 5$$

10. Given the quadratic equation $y = x^2 + 3x - 18$

- a. Identify the x-intercept(s) b. Identify the vertex c. Identify the y-intercept

11. For $f(x) = \sqrt{2x-8}$, evaluate each of the following.

- (a) $f(12)$ (b) $f(6)$ (c) Find the value of x for which $f(x) = 3$.

12. Find the intersection(s) of $f(x)$ and $g(x)$. Explain your method completely.

$$f(x) = 3x^2 - 8x + 4 \qquad g(x) = 4x^2 - 6x + 1$$

13. Consider the sequence 3, -1, -5, -9, ...

- a. Make a table and graph (use graph paper!) for the first six terms of the sequence.
Assume the first term (3) is $n=1$
- b. Write an explicit rule $t(n)$ for each term in the sequence, where n is the term number.
- c. Write a recursive rule for each term in the sequence.
- d. Use your rule to find the 10th term.
- e. Can $t(n) = -26$? Use your rule to help you explain why or why not.

14. Given the function $f(x) = \frac{1}{x+4}$

- a. Make a table and complete graph (be sure to label key points). Use graph paper.
- b. Identify the following if they exist:
- i. Domain
 - ii. Range
 - iii. x-intercept(s)
 - iv. y-intercept(s)
 - v. Equation of asymptote(s)